Omega Site: OPOG Groundwater Modeling Meeting/Questions

Ed Modiano to: Lynda Deschambault   03/16/2010 10:54 AM
Cc: "David Chamberlin", Tom.Perina, Frederick Schauffler

History: This message has been replied to.

Lynda:

As requested, this e-mail confirms that CDM (Dave Chamberlin and Karen Kelly) and OPOG representative Joe Guarnaccia will be participating in the morning groundwater modeling session on March 18th at the office of CH2MHill located in Santa Ana. I will be participating as well. In brief Joe is the BASF responsible party representative and is an OPOG technical committee member who has been chairing the groundwater modeling effort with CDM.

Also, attached to this e-mail is a draft internal CDM memo that provides a series of questions to be discussed during the groundwater modeling meeting.

If you have any questions or require additional information, please contact me.

Sincerely,

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Memorandum

To: *Dave Chamberlin*

From: *Karen Kelley and Bob Fitzgerald, CDM*

Date: *March 16, 2010*

Subject: *Omega Model Data Request – List of Questions*

Omega Model Input Information

After a review of the data provided by CH2M Hill in November 2009, CDM has the following questions and requests for clarification. If additional data are provided, spreadsheet files, geo-referenced GIS shapefiles, or ASCII text file formats are preferred.

Model Geometry

- Model grid (nodal coordinates x, y, z; list of nodes defining each finite element) for all 13 model layers. Did the discretization change for the FS model?

- Spatial distribution of hydraulic conductivity assignments for each model layer, (Kh, Kv). Confirm that the Kh and Kv shapefiles provided earlier to OPOG were the same as those used in the final FS model.

- Please confirm the spatial distribution of specific yield assignments in the FS model was the same as used in the RI model as shown in Appendix K, Figure K-9.

- The hydraulic conductivity distributions in the FS model resulting from PEST calibration represent a fairly major change from the model described in the OU2 RI Report. How has the conceptual model of the depositional sequence changed, and how does the new hydraulic conductivity distribution relate to that?

Boundary Conditions

- The model documentation states that the specified head boundaries were assigned perpendicular to the groundwater flow contours of the USGS model "to minimize groundwater flow across the head boundaries (they are no-flow boundaries along most of their length)." Did this assumption prove to be reasonably valid or consistent with the for all areas, including near the spreading basins and near the injection wells at Los Alamitos Gap, for all periods of time and the steady-state conditions?

- Please explain why fixed head boundary conditions on the northwest and southeast boundaries were applied only at the levels corresponding to USGS model levels? How did fixing only selected boundary nodes affect the model?

- Please provide fixed head assignments used in the model for representing both (1) 2000-September 2008 transient conditions and (2) steady-state conditions. These were missing from the materials provided to OPOG in November 2009.

Applied Model Stresses

- Was consideration given to applying the mountainfront recharge to layers deeper than the top active model slice representing the water table? Did that ever result in recharge assigned to a low-conductivity unit?

- Was regional water supply pumping and industrial pumping applied at the x,y locations indicated for each POW time series? How do these x,y locations relate spatially to the USGS model cells? Please provide a list of POWs that were applied within the FEFLOW model boundaries.

- How were pumping extractions from wells in the vicinity of the plume assigned, e.g., at wells SFS #1 and the 3 Golden State Water Company wells, Pioneer #1, Pioneer #2, and Dace #1? Are there any other active pumping wells in the plume vicinity? How were the regional USGS pumping rate assignments (POWs) adjusted to account for these wells?

- Please provide the volumetric budget table values for the FS model, similar to RI Appendix K, Table K-3, (1) for the transient period 10/1970 – 9/2008 simulation and (2) for the steady-state simulation.

- Were any adjustments made to the mountainfront recharge, contributing watershed areas, or vertical application of the fluxes?

- Please confirm the algorithm for applying recharge to spreading basins including the Rio Hondo and San Gabriel Basins and the unlined section of the San Gabriel River. What does this value represent?

- Please provide values for monthly surface recharges applied during 10/2006 – 9/2008 (the extended model period represented with the FS model) as shown in RI Appendix K Table K-1-B for 10/2000 – 9/2006.

Special features - faults

- Was the Newport-Inglewood Uplift (NIU) the only fault represented in the model?

Initial Conditions

- Please provide the initial head distribution used for (1) the transient FS simulation and (2) the FS steady-state simulation.

Regional and Local Flow Model Calibration Data

- Please provide the historical water level elevation measurements from monitoring wells 2S/11W-5L1 and 2S/11W-6G2, and their x,y locations and screened intervals (TOS, BOS elevations).

- Please provide shapefiles of simulated water table contours used for comparison with observed data in Figure K-13 of the OU2 RI Report and Figure A-12 of the OU2 FS Report.

Transport Model Data

- Source characterization: please provide the PCE mass loading rates resulting from the constant concentration assignments simulated for each source area.

- What was the timing of releases simulated to generate PCE plume contours shown in RI and FS figures (e.g., OU2 RI Report Figure K-15 and OU2 FS Report Figure A-7). Was the mass loading rate held constant throughout the simulations?

- What retardation factors and effective porosities were assumed for the RI and FS model simulations of the PCE plumes? What partitioning coefficients and values for fraction of organic carbon in soils were used in calculation of retardation factors, as applicable?

- What period of transport time do the model simulated pathlines shown in Figure K-14 of the OU2 RI Report and Figure A-7 of the OU2 FS Report represent? Were these generated with the transient or steady-state model? Please provide these in shapefile format.

- Please provide details of any Freon modeling, if applicable, including source characterization, timing of releases simulated, retardation factors, and effective porosities used in the simulations.

- Given the relatively flat hydraulic gradient and lower hydraulic conductivities near the Omega site, what are estimated rates of contaminant travel near the Omega site? What is the model-calculated contaminant transport time from the Omega site to the Angeles and McKesson sites?